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DEVELOPMENT AND EVALUATION OF A NAVAL FLIGHT OFFICER SCORING KEY FOR THE NAVAL AVIATION BIOGRAPHICAL INVENTORY

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NAVAL AEROSPACE MEDICAL RESEARCH LABORATORY
PENSACOLA, FLORIDA

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SUMMARY PAGE

THE PROBLEM

Naval flight officer candidate attrition in undergraduate training has increased from a low of 20 percent in the early 1960s to more than 40 percent within the last five years. One means of reducing attrition is to increase the efficiency of the Naval and Marine Aviation Selection Test Battery used to select candidates for the various naval flight officer (NFO) aviation training programs. The scoring key for the Biographical Inventory (BI) developed for a pilot population is currently being used to select both aviators and naval flight officers into naval aviation training programs. Previous experience with biographical data suggested that a scoring key developed specifically for the NFO subject population should increase the efficiency of the Biographical Inventory selection test. The present report represents an evaluation of such a scoring key.

FINDINGS

Results indicated that a Biographical Inventory, specifically keyed for a naval flight officer population, with aerospace knowledge questions excluded was a better predictor of naval flight officer candidate attrition than the Biographical Inventory keyed for a pilot population. This predictive superiority was lessened when aerospace knowledge questions were omitted from the conventional BI score.

RECOMMENDATIONS

It is recommended that the newly developed NFO BI key, with aerospace knowledge questions excluded, be considered for use in the Naval and Marine Aviation Selection Test Battery. If the newly keyed BI is not adopted for NFO selection, then it is suggested that the scoring of aerospace knowledge questions be omitted from the BI presently used for this population in order to increase the effectiveness of naval flight officer selection.

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INTRODUCTION

In the Naval Aviation Training Program, attrition is considered a serious problem, since it represents both a financial and a manpower loss. Attrition refers to those students who are removed from training because of academic or inflight performance difficulities, and to those who voluntarily withdraw from training. Within the training program, there are two basic types of students: student naval flight officers (NFOs) and student naval aviators (SNAs). Of these two student types, the attrition rate from undergraduate training is much higher for NFOs than for SNAs. Griffin and Mosko (2) reported that the average attrition rate for pilots was 25 percent from 1962 through 1976, while the NFO attrition rate had increased from a low of 20 percent in the early 1960s to more than 40 percent within the last five years.

One means of reducing attrition is to increase the efficiency of personnel selection for NFO training. Naturally, early identification of potential attrites provides the best savings. The Naval and Marine Aviation Selection Test Battery is used as an initial screening device to select from potential candidates those individuals most likely to succeed in training. The battery consists of four separate paper-and-pencil tests: Academic Qualification Test (AQT), Mechanical Comprehension Test (MCT), Spatial Apperception Test (SAT), and the Biographical Inventory (BI) (1).

The Biographical Inventory is the only instrument in the test battery with noncognitive type questions. Currently the BI scoring key used to select both pilots and NFOs was developed on the pilot population. The current (1971-1974) validity of the BI key for the two student types is shown in Table I. The zero-order correlation of the BI was related to the training Pass/Attrite

Table I

Biographical Inventory Validity Coefficients for a
Pilot and NFO Population

Criterion/ Sample	Predictor Variables	Zero Order r	Multiple R	R2	Increase in R
Pass/Attrite	AQT	.082	.082	.007	.082
Pilot	MCT	.117	.127	.016	.045
N = 702	SAT	.109	.153	.023	.026
	BI	.212	.245	.060	.092
Pass/Attrite	AQT	.172	.172	.029	.172
NFO	MCT	.221	.234	055	.062
N = 1039	SAT	.166	.241	.058	.207
	BI	.156	.244	.060	.003

criterion for both groups. The BI for the NFO group does not account for additional unique variance in a multiple regression equation beyond that provided by the other selection tests. However, for the pilot group the BI increased the explained variance by 27 percent. As a result of these findings a new scoring key was developed for the NFO population to increase the efficiency of the BI selection test. The development of the NFO BI key and its subsequent evaluation are the subjects of the present study.

PROCEDURE

SUBJECTS

Records for all NFO candidates who entered the Naval Aviation Training Program between July, 1971, and January, 1974, were extracted from the Naval Aviation Medical Research Laboratory (NAMRL) data bank. NFO candidates are recent college graduates who enter training directly from civilian life without prior military training. It is this group of NFOs who have the highest attrition rate and is the population of major concern. Of the 1,039 subjects whose records were available for analysis, 509 completed training and 530 attrited, for an attrition rate of 51 percent.

BIOGRAPHICAL INVENTORY

The BI is an untimed, multiple-chcice questionnaire containing 160 questions. The first 110 questions pertain to biographical information and the last 50 to general aerospace knowledge. There are two forms of the questionnaire with a different set of aerospace knowledge questions in each form. The biographical questions are identical in the two tests and are the questions of concern for development of the NFO BI key.

For the BI scoring key the biographical alternatives which discriminate between successful and unsuccessful candidates are assigned weights of +1 or -1 depending upon the relationship to the dichotomous Pass/Attrite criterion. The aerospace knowledge questions are scored as correct or incorrect, +1 or 0. The sum of the weights of the biographical portion and the number of correct aerospace questions comprise the total BI score.

NFO BI KEY DEVELOPMENT METHODS

When subject records were initially evaluated, two major problems became apparent. First, as shown in Table I, the BI did not account for additional variance in the Pass/Attrite criterion beyond that provided by the other selection tests. The inter-correlation matrix of the selection tests and the Pass/Attrite criterion in Table II indicates that the BI is highly correlated with the MCT. An additional multiple regression analysis which forced the BI into the equation before the MCT was performed to see if the two tests were accounting for a unique portion of the variance. In this analysis the MCT did not contri-

Table II

Selection Test Correlation Matrix

	AQT	MCT	SAT	BI	CRITERION PASS/ATTRITE
AQT	1.000	.472	.349	.296	.172
MCT		1.000	.468	.519	.221
SAT			1.000	.327	.166
BI				1.000	.156

bute to the multiple regression equation. These results demonstrate that the MCT and BI are explaining the same portion of the criterion and, for NFOs, have no independent predictive power.

The second difficulty concerned the size of the subject population in relation to the number of test item alternatives. To conduct a meaningful item analysis, an integral process in the development of a new scoring key, the subject population should be considerably larger than the number of alternatives to avoid obtaining high validity coefficients based on chance differences. With noncognitive tests such as the biographical portion of the BI, each question alternative must be assessed individually since there is no "correct" response. The BI contains 440 biographical test answer alternatives. While the NFO subject population (1039) is substantial, it does not meet the generally accepted standards regarding sample size.

To overcome these difficulties, two different methodologies were developed: Residual Criterion and Item Analysis by Sampling. These methods are discussed in the following text.

Residual Criterion

Item selection for the individual tests in the selection test battery used the dichotomous Pass/Attrite training criterion. As a result, each test contains items related to the same criterion. If item selection was based on that part of the criterion which other tests have not already explained, a test could be more uniquely predictive. It was decided to develop an NFO BI key based on an item analysis which used the residual criterion variance, that portion of the criterion which is not predictable from other tests in the battery. A key developed by this method should theoretically maximize explained variance, since overlap with the other tests would have been largely eliminated.

To develop the new criterion, a multiple regression analysis was performed, using a forward selection procedure. The selection test scores, excluding the BI, were forced into the equation in the following order: AQT, MCT, and SAT. The resultant multiple regression equation was then used to obtain the predicted criterion score for each individual. The predicted score was subtracted from the individual's actual criterion score to obtain the remaining or residual criterion. In this case, the true criterion score was 1 for successful completion of training and 0 for attrite. A constant value of 2 was added in order to obtain positive values.

$$Y' = A + (B_1)AQT + (B_2)MCT + (B_3)SAT$$

$$\text{Residual criterion} = Y - Y' + 2$$

where

Y' = predicted score	B_1 = beta weight for AQT
Y = criterion score	B_2 = beta weight for MCT
A = constant	B_3 = beta weight for SAT

Item Analysis by Sampling

A viable approach for assessing alternatives of a test question is to determine the discriminability (D) index for an alternative. With this technique, a D_i score is computed as the difference between proportions of the two criterion groups choosing a given alternative. Due to the restricted sample size, it was decided to use sampling procedures to obtain multiple D index values and then use the binomial expansion rule to define the distribution of the discriminability indexes (D_i). This approach was used to stabilize validity coefficients for alternatives and to estimate the error involved with each validity.

One hundred samples, containing 100 subjects each, were randomly selected from the data pool. No subject was selected twice within a sample. For every sample, a D_i was calculated for each alternative as well as a phi coefficient of the alternative with the criterion scores. D_i was calculated as follows:

$$D_i = \frac{P_1}{X} - \frac{P_0}{Y}$$

where

P_1 = number of successful students who selected the alternative.

P_0 = number of successful students who did not select the alternative.

X = total number of people who selected the alternative.

Y = total number of people who did not select the alternative.

As can be seen by the equation, D_i is the difference between the percentage of successful students from the total group who selected the item and the percentage of successful students who did not select the item. D_i ranges in value between ± 1. For some samples, certain alternatives were not chosen by any respondents or were chosen by everyone. Since there was no variability in the alternative responses, D_i was set to zero whenever X or Y equaled zero.

Each alternative had a distribution of D_i's taken over 100 samples. The mean of all D_i values, $\bar{D}$, and the corresponding standard deviation for each alternative were calculated. $\bar{D}$ reflects the magnitude of the proportional differences across samples between responses of successful and unsuccessful students. The larger the absolute value of $\bar{D}$, the greater the discrimination of the alternative. For developing a BI key, a positive $\bar{D}$ suggests positive keying while a negative $\bar{D}$ suggests a negative keying. The standard deviation of the sample values of D_i reflects the stability of the discrimination. The larger the standard deviation, the less agreement across samples.

Since nothing was known about the D_i distribution, e.g., how large a standard deviation is "too large," it was decided to use a measure of consistency of the direction of D_i differences found between samples. In this case, the number of samples with positive D_i values minus those with negative D_i values was divided by the number of sample. The resultant values were converted to percentages and scaled to a range of from 0 to 100. The centerpoint, 50, indicated no discrimination, 100 perfect positive discrimination (i.e., the signs of D_i were positive in all samples), and 0 indicated perfect negative discrimination. The Z statistic was used to describe the distribution of the scale consistency score.

In addition to $\bar{D}$, an average reliability phi coefficient or point bi-serial across samples was obtained as a measure of validity for each alternative. For BI keying, an ideal item alternative would have a high (100) or low (0) scaled consistency score with a Z probability less than .10 and an average phi coefficient which indicates validity for the alternative.

METHOD

In order to evaluate the use of a residual criterion, two new BI keys were developed, one based on an item analysis using the Pass/Attrite dichotomous criterion and the other using the residual criterion. The item analysis sampling procedure was used for both. Item selection was based upon the scaled consistency index, the Z score, the average phi coefficient or point biserial, and background knowledge concerning the usefulness of the alternatives. In addition, the number of times D_i equaled 0 was taken into consideration since the statistical measures based on only a few discriminating samples would be unstable and therefore unreliable. The newly developed BI keys were then applied to the same NFOC population to determine the proficiency of the newly developed scoring procedures.

Since the pilot BI key includes the aerospace knowledge questions as part of the total score, the new NFO BI keys were evaluated with and without the inclusion of the aerospace knowledge questions. In addition, the aerospace knowledge questions were deleted from the pilot BI key, leaving only the biographical portion of the test to be used as a predictor variable in order to make direct comparisons between the old pilot BI key and the new NFO BI keys. The scoring procedures are denoted as follows:

1.	Old BI.	Present pilot key with aerospace knowledge questions.
2.	New BI.	New NFO BI key based on a dichotomous criterion.
3.	Residual BI.	New NFO BI key based on the residual criterion.
4.	New BI + AK.	New NFO BI key based on a dichotomous criterion with aerospace knowledge questions.
5.	Old BI - AK.	Present pilot key without the aerospace knowledge questions.
6.	Residual BI+AK	New NFO BI key based on the residual criterion with aerospace knowledge questions.

In the evaluation of the new BI keys, three dichotomous training criteria were utilized. The training criteria are identified as follows:

1. Pass/DOA. DOA (Drop on Arrival) is a type of voluntary withdrawal which occurs during the first twelve weeks of school in Naval Aviation Schools Command.

2. Pass/DOR and Flight or Academic Failure. A DOR (Drop on Request) is a voluntary withdrawal from training occurring after the student receives his commission.

3. Pass/Attrite. Attrite includes all attrition groups mentioned above.

A series of multiple regression analyses was performed, using a forward selection procedure. The AQT, MCT, and SAT selection test scores were forced into the equation initially, followed by one of the BI scoring procedures. The purpose of this effort was to determine to what extent each BI scoring procedure accounted for additional variance beyond that provided by the other selection tests.

RESULTS AND DISCUSSION

The results of the analyses are depicted in Table III. In Table III, and other succeeding tables, each of the BI scores represents the fourth variable forced into the regression analyses and should not be interpreted as an additional variable added to the prediction equation. This format was followed so that comparisons of the relative efficiency of the BI scoring processes could readily be made.

Table III

Summary of Initial Validation Regression Analysis for an NFOC Population (1039 subjects)

Criterion		Predictor Variable	Zero Order r	Multiple R	R^2	Increase in R
Pass/Attrite (51% attrition)	(1) AQT		.172	.172	.029	.172
	(2) MCT		.221	.234	.055	.062
	(3) SAT		.166	.241	.058	.007
		. Old BI	.156	.244	.060	.003
	(4) BI	. New BI	.336	.356	.127	.115
		. Residual BI	.376	.424	.180	.183
		. New BI + AK	.254	.289	.083	.048
		. Old BI - AK	.130	.247	.061	.005
		. Residual BI+AK	.321	.342	.117	.101
Pass/DOA (36% attrition)	(1) AQT		.121	.121	.015	.121
	(2) MCT		.152	.163	.026	.042
	(3) SAT		.111	.166	.027	.004
		. Old BI	.122	.172	.030	.006
	(4) BI	. New BI	.325	.329	.108	.162
		. Residual BI	.389	.409	.167	.243
		. New BI+AK	.235	.244	.060	.078
		. Old BI - AK	.100	.174	.030	.007
		. Residual BI+AK	.312	.316	.100	.150
Pass/DOR, Flight or Academic Failure (33% attrition)	(1) AQT		.213	.213	.045	.213
	(2) MCT		.281	.296	.088	.083
	(3) SAT		.213	.306	.094	.010
		. Old BI	.179	.307	.095	.001
	(4) BI	. New BI	.321	.373	.139	.067
		. Residual BI	.333	.423	.179	.117
		. New BI + AK	.249	.329	.109	.023
		. Old BI - AK	.148	.309	.095	.003
		. Residual BI +AK	.302	.360	.130	.054

All zero order r s and multiple Rs are significant at either the .05 or .01 level of confidence.

The zero-order correlations indicate the typically low but significant relationship of the AQT, MCT, and SAT to the three dichotomous training criteria. The correlations are low because they are based on trainees who have already qualified on these screening tests for the naval aviation program. The correlations would be substantially higher if the predictor variables were applied to an unscreened subject population. The comparisons of the BI scoring keys indicate that for all criteria, the newly developed BI key based on the residual criterion was superior to all other BI scoring processes. For the Pass/Attrite criterion, the step increase in the multiple R was .183, increasing the amount of explained variance of the combined AQT, MCT, and SAT from 5.8 percent to 18 percent. The BI developed on the Pass/Attrite criterion has a step increase of .115, which increased the amount of explained variance to 12.7 percent.

The most consistent finding of the new scoring keys was the drop in predictive power when the aerospace knowledge questions were included in the BI score. The zero-order correlations indicate that these questions must not be related to the criterion for NFOs. Separate correlations of the aerospace knowledge questions to the training criterion were obtained to substantiate this hypothesis. The correlational data showed an $\underline{r}$ of .066 for the pass/attrite group, .050 for the pass/DOA group, and .076 for the pass/DOR and flight or academic failure group. These correlations are unusually low, indicating that the aerospace knowledge questions are of no practical value for the NFO population. For a pilot population, the correlation between the aerospace knowledge questions and the Pass/Attrite training criterion showed that these questions were very useful in the total BI score for that group. The zero-order correlation was .164, which is a substantial relationship.

As previously indicated (see Table II), a major problem with the use of the pilot BI key for the NFO population was the high relationship of the BI scores to the MCT scores. Table IV illustrates that the newly developed residual BI key has a lower relationship to the AQT, MCT, and SAT than either the new BI based on the dichotomous criterion or the old BI. Additionally, the new BI key developed with a true dichotomous criterion does not have as high a correlation to the selection tests as the old pilot BI.

Table IV

Correlation of BI Keys to Selection Tests

KEYS	AQT	MCT	SAT
New BI	.260	.414	.235
Residual BI	.136	.135	.117
Old BI	.296	.519	.327

In order to ascertain if the residual criterion was indeed independent of the selection test, the relationship of the residual criterion score to each selection test was acquired. The results indicated that the residual criterion score had a .006 relationship with the MCT, .012 with the AQT, and .004 with the SAT. Although the residual criterion is unique, the BI items themselves are not completely independent of the other tests. As indicated in Table IV, the residual-keyed BI has a correlation of .136 to the AQT, .135 to the MCT, and .117 to the SAT.

NFO BI KEY VALIDATION

Although the sampling procedure was used to minimize capitalization on chance relationships, the initial BI analysis is based on the same sample that was used in development of the new BI keys. Results could be spurious and should be validated on a new sample. To validate the new keys, records of all NFOCs who entered training between January, 1974, and January, 1977, were extracted from the NAMRL data bank. Many of these students were still in training and had incomplete records. Of the 607 complete records that were used for analysis, 291 completed training and 316 (52 percent) attrited. All aspects of the initial phase of the study were maintained except for the addition of a new dichotomous training criterion. In this case, the previous pass/DOR, academic or flight failure group, was separated into two groups, pass/DOR and pass/academic or flight failure. As before, a series of multiple regression analyses was performed with the AQT, MCT, and SAT forced into the equation first, followed by one of the BI scoring keys.

Table V shows the results of the multiple regression analyses. For the Pass/Attrite criterion the AQT, MCT, and SAT accounted for 2.9 percent of the variance. The residual BI key increased the explained variance to 5.4 percent, the new BI key developed on the dichotomous criterion to 5.3 percent, and the old pilot key to 3.5 percent. When the aerospace knowledge questions were deleted from the old pilot BI key, the amount of explained variance increased from 3.5 percent to 4.4 percent. For the newly developed BI keys, once again the inclusion of the aerospace knowledge questions decreased the predictive power of the BI.

For the pass/DOA criterion group, only the new BI keys had any substantial improvement in accounting for additional variance beyond the selection tests. The selection tests explained 1 percent of the variance with the old BI or old BI-AK, increasing the explained variance to 1.5 percent, the residual BI to 2.6 percent, and the new BI to 2.7 percent. The same trend is noted for the pass/academic or flight failure group. The AQT, MCT, and SAT selection tests accounted for 7.8 percent of the variance. When the old BI-AK was added, the explained variance increased to 8.5 percent while the residual key accounted for 9.6 percent and the new BI key accounted for 9.3 percent. For the pass/DOR group, the pilot BI key without the aerospace knowledge questions (Old BI-AK) accounted for more variance beyond the selection tests than the other keys. The explained variance of the selection tests increased from 4.3 percent to 8.4 percent for the BI-AK, to 8.2 percent for the residual BI, and 7.5 percent for the new BI. The aerospace knowledge questions decreased the amount of explained variance in 11 of 12 cases. It should be noted that for both the validation sample and the cross-validation sample, the old pilot BI key contributes little to the multiple $\underline{R}$ relationships.

Table V

Summary of Cross-Validation Regression Analysis for an NFOC Population. (607 Subjects)

Criterion	Predictor Variable		Zero Order r	Multiple R	R^2	Increase in R
Total Pass/Attrite (52% attrition)	1. AQT		.121	.121	.015	.121
	2. MCT		.141	.154	.024	.033
	3. SAT		.133	.171	.029	.017
	4. BI	Old BI	.140	.187	.035	.016
		New BI	.203	.230	.053	.059
		Residual	.204	.232	.054	.061
		New BI + AK	.162	.197	.039	.026
		Old BI - AK	.155	.209	.044	.038
		Residual + AK	.145	.200	.040	.029
Pass/DOA (35% attrition)	1. AQT		.001+	.001+	.000	.001
	2. MCT		.083+	.092+	.009	.091
	3. SAT		.075+	.105+	.011	.013
	4. BI	Old BI	.098	.122+	.015	.017
		New BI	.152	.166	.027	.061
		Residual	.150	.162	.026	.057
		New BI +AK	.133	.148	.022	.043
		Old BI - AK	.085	.121+	.015	.016
		Residual + AK	.137	.154	.024	.049
Pass/Flight or Academic Failure (18% attrition)	1. AQT		.240	.240	.058	.240
	2. MCT		.191	.255	.065	.015
	3. SAT		.185	.278	.078	.024
	4. BI	Old BI	.112	.278	.078	.000
		New BI	.192	.305	.093	.027
		Residual	.166	.310	.096	.032
		New BI + AK	.127	.279	.078	.001
		Old BI - AK	.135	.292	.085	.014
		Residual + AK	.117	.280	.078	.002
Pass/DOR (24% Attrition)	1. AQT		.178	.178	.032	.178
	2. MCT		.148	.192	.037	.014
	3. SAT		.138	.207	.043	.015
	4. BI	Old BI	.173	.232	.054	.025
		New BI	.224	.273	.075	.066
		Residual	.214	.286	.082	.079
		New BI + AK	.171	.230	.053	.024
		Old BI - AK	.237	.290	.084	.083
		Residual + AK	.161	.232	.054	.025

All zero order r s and multiple Rs are significant at either the .05 or .01 level of confidence unless marked +.

Table VI provides the correlations of certain BI keys to selection tests based on the total pass/fail criterion of the validation population sample. The results indicate that the residual BI maintained its relative independence of the AQT, MCT, and SAT tests. Further, the results indicate that the new BI key is more independent of the selection test scores than the old pilot BI key.

Table VI

Correlation of BI Keys to Selection Tests

BI KEYS	AQT	MCT	SAT
Residual BI	.100	.100	.140
New BI	.210	.310	.220
Old Pilot BI	.222	.430	.300

CONCLUSIONS

The validation results indicate that the new NFO BI keys which do not include the aerospace knowledge questions are better predictors of NFOC attrition than the pilot BI key as it is presently being used. When the aerospace knowledge questions are extracted from the old pilot BI score, the predictive power of that key increases, but is not so great as either of the two newly developed BI keys. Although the increase of explained variance over the old pilot BI without the aerospace questions is small, the increase can be considered significant. The increase does indicate that the efficiency of the BI has been improved, which should increase the effectiveness of the selection test battery as a screening device.

Little or no difference was noted in the validity data between the BI key based on the residual criterion and the key based on a dichotomous criterion. Although decisions for establishing the sampling procedures for the item analyses were arbitrarily selected, it can be assumed that the methodology was useful, since both keys were successfully validated. Thus, it appears that reliable item weights can be obtained by the sampling methodology when the subject/item ratio is considered inappropriate for conventional analyses.

More studies are needed in order to know the limitations of the item analysis by sampling procedure, and when it can be used appropriately. A monte-carlo technique could be used to ascertain what the subject/item ratio needs to be, how many samples need to be pooled, and how many subjects are required in each sample. In addition, the parameters of the D_i distribution should be assessed so that it can be used as an effective statistic.

It was expected that the residual BI would be more effective than the new BI based on the dichotomous criterion. The residual BI key did remain relatively independent of the other selection tests in the first and second sample; however, cross-validated results indicated no significant differences in the amount of variance explained by the two keys. Since these results were unexpected, further research is required in order to determine why the residual criterion procedures were not more efficient.

RECOMMENDATIONS

Due to the findings of the present study, it is recommended that the new NFO BI key, excluding aerospace knowledge questions and developed with the conventional dichotomous criterion, be considered for use in the Naval Aviation Selection Test Battery. If the new BI key is not adopted for NFO selection, then the aerospace knowledge questions should be deleted from the total pilot BI key score for the NFO candidates in order to increase the effectiveness of the present scoring key.

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Naval flight officer candidate attrition in undergraduate training has increased from a low of 20 percent in the early 1960s to 40 percent within the last five years. One means of reducing attrition is to increase the efficiency of the Naval and Marine Aviation Selection Test Battery used to select candidates for the various naval flight officer aviation training programs. The scoring key for the Biographic Inventory developed for a pilot population is currently being used to select both aviators and naval flight officers into naval aviation training-

programs. Research personnel at the Naval Aerospace Medical Research Laboratory reasoned that a scoring key developed specifically for the NFO subject population might increase the efficiency of the Biographical Inventory selection test. The present report represents an evaluation of a Biographical Inventory specifically keyed for a naval flight officer population.

Results indicated that a Biographical Inventory, specifically keyed for a naval flight officer population, with aerospace knowledge questions excluded, is a better predictor of naval flight officer candidate attrition than the Biographical Inventory keyed for a pilot population with or without aerospace knowledge questions excluded.

It is recommended that the newly developed NFO-BI key, with aerospace knowledge questions excluded, be considered for use in the Naval and Marine Aviation Selection Test Battery. If the newly keyed BI is not adopted for NFO selection, then it is suggested that scoring of aerospace knowledge questions be omitted from the presently used BI in order to increase the effectiveness of naval flight officer selection.